US ENVIRONMENTAL PROTECTION AGENCY, REGION 2
FILTRATION PLANT INSPECTION FORM
(Modified by K. Sable with NEIC)

Basic Information

System Name: Newark Water Department PWSID: NJ0714001
Filtration Plant Name: Pequannock Water Filtration Plant

Address: 2224 Route 23 North, West Milford, New Jersey 07480

Type of Filtration Provided: Direct

Average Daily Demand (MGD)	Peak Daily Demand (MGD)	Total Production Capacity (MGD)	FP Design Capacity (MG)
35 – 45 MGD	45 MGD	50 MGD	80 MGD

Storage Capacity	Raw Water (MG)	Treated Water (MG)
650 MG (usable storage approximately 500 MG)	2964 MG Need to look at MP	650 MG (see attached Cedar Grove Reservoir Table)

Staffing and Certification Information		
Name	Position	Certification/Agency
See attached Memorandum of 2013 Licensed Operators		Newark PWS provided a copy of the Licensed Operator Certification by NJDEP **(Attachment A)** on February 19, 2014.
Required Plant Operator Certification: T-4/W-4		

Inspection Participants	
Name	Agency
See attached Opening Conference Sign In Sheet dated 02/10/2014 (in addition to below participants) **Attachment B**	
Syed Imteaz Rizvi (not listed on Opening	NJ DEP

Conference sign-in sheet)	

Treatment Diagram or Description

See Attachment C (with hand amended modifications documenting on-site observations)

List of Facilities and Description	See above diagram

Source

1. Is any treatment provided in the reservoir? In Charlotteburg Reservoir copper sulfate is added seasonally (when necessary) for algae.

2. How often is the intake(s) inspected? Daily, including traveling screens, monitors and pumps.

3. Is raw water monitored? For what parameters? A raw water sample is taken every day and evaluated for turbidity, pH, conductivity, temperature, color, alkalinity, total hardness, calcium, and total organic carbon (TOC). Algae is monitored seasonally via sampling in the reservoir and analyzing the sample in the laboratory for two types of algae.

4. Are there are fluctuations in raw water quality? Yes, raw water quality fluctuates during storm events and turnover which occurs in the spring and fall. Facility representatives explained that storm events include 2 inches or more of sudden precipitation or thunder storms. Windy conditions also affect raw water quality; however, during the winter when the reservoir is frozen the raw water quality is relatively constant.

5. Comments: SCADA monitoring system at this location includes screen monitoring which will alarm if there are problems.

Aeration

Type: Spray (but not in use anymore)

Comments: Facility representatives explained that aeration was used for taste and odor control but the equipment was taken off-line when filtration was installed in 1990. In addition, due to changes in the plant operation, the customers do not report taste and odor concerns anymore.

Odor/Taste Control

Powdered Activated Carbon? No KMnO4? No
Dosage: N/A

Comments: Seasonal addition of copper sulfate (if necessary for the control of algae growth in the reservoir) as part of raw water treatment.

Chemicals in Use

Chemical	Point of Use	ANSI/ NSF certified?	Reason for Use	Stored Properly?	Method for Determining Dosage?
Chlorine gas	- Pre-chlorination before treatment plant in pretreatment building though diffusers into flume	See **Attachment A**	Disinfection	Yes	To maintain set residual concentration
Liquid sodium hypochlorite	- Post Chlorination after lime addition in chemical building via pipe into flume - Rechlorination in Montclair building via line feed into flume			Yes	To maintain set residual concentration
Mixture of aluminum sulfate and 5% polymer	Before treatment plant in pretreatment building through pipe into flume		To form flocculant and increase settling	Yes	Based on jar testing in laboratory and calculated flow in partial flume (in MGD)
Copper Sulfate	At intake in Charlotteburg Reservoir		Reduce algae population	Yes	Perform grab sampling at various locations in reservoir and check for algae count

Polyaluminum Chloride (PACl)	At treatment plant via pipe into first section of the mixing chamber		To form flocculant and increase settling	Yes	Based on jar testing in laboratory and calculated flow in partial flume (in MGD)
Sodium Silicate	At treatment plant as water exits the plant		Corrosion control	Yes	Aim for 6-8 parts per million (PPM) based on the Lead and Copper Rule
Mixture of Magnifloc® polymer (at 35%) and No. A1883 polymer (at 0.25%)	At the treatment plant in the decant tanks through a pipe into the channel	Yes	To increase settling and flocculation before recycling water to the head of the treatment plant	Not sure Magnifloc® has adequate secondary containment	Try to maintain Magnifloc® at 1.0 mg/L and No. A1883 at 0.2 mg/L. Fluctuates seasonally with more necessary in the winter and less required in the summer. Based on jar testing in laboratory and flow in plume calculated in MGD
Lime	At treatment plant in chemical building		Corrosion control	Yes	Based on laboratory analysis and flow in plume calculated in MGD

Equipment Calibration

Equipment	Calibration Frequency
Scale for chlorine in pretreatment building	Annually by an outside contractor
Turbidity meters for each filter in the treatment plant	Every 1-2 weeks performed internally
CFE Chlorine meter	Monthly (via internal work order) and perform grab sample laboratory check
CFE Turbidimeter	Daily grab sample laboratory check internally plus biweekly check against standards
CFE pH	Monthly (via internal work order) and perform grab sample laboratory check
Wayne pump station pH meter	Biweekly internally
Chlorine meter in Montclair building	Biweekly performed internally

Turbidity Removal

Coagulation		Sedimentation	
Is coagulant used at all times?	Yes	Number and type of sedimentation basins?	NA - No designated sedimentation basins but occurs at various locations throughout the process including the mixing chamber, filters, holding tanks and decant tanks. A sludge lagoon is used as storage for sludges collected throughout the system.
Type of coagulant used? Why?	-Mixture of aluminum sulfate and 5% polymer to form flocculant and increase settling as part of pretreatment -PACl in the mixing chamber to form flocculant and increase settling as part of the treatment process -Mixture of Magnifloc® polymer (at 35%) and No. A1883 polymer (at 0.25%) in the decant tanks to increase settling and flocculation before recycling water to the head of the treatment plant	Is the water clear near the outlet of the sedimentation basin?	NA
How coagulant is added to the treatment?	- Mixture of aluminum sulfate and 5% polymer through pipe into flume - PACl via pipe into first section of the mixing chamber - Mixture of Magnifloc® polymer (at 35%) and # A1883 polymer (at 0.25%) into treatment channel via pipe	Turbidity of the settled water (if measured)	NA

Dosage?	Based on flow in partial flume and jar tests performed in laboratory	How often is sludge removed?	NA
Are jar test conducted?	Yes	Basin condition	NA
What initiates a jar test? How often is conducted?	Routine practice on a weekly basis. If concerns arise more frequently then additional tests will be conducted	Volume or measurements of basin	NA
Flocculation		**Filtration**	
Number of floc basins	NA - No designated floc basins but occurs at various locations throughout the system including in pretreatment, the mixing chamber, and the decant tanks. See coagulation section and the chemical section for more information	Number of filters	12
Type of floc basins	NA	Type of filters gravity or pressure	Gravity
Volume or measurements of basin	NA	Filter media type (single, dual, multi)	Dual (anthracite and sand)
Are flocculators adjustable?	NA	Visible problems on the surface of the filter?	No
Does floc formation appear adequate?	NA	Are rapid fluctuations present in the flow?	No
Backwash		Pressure filter:	No
Is a surface wash or air scour present?	Yes, surface wash	Last internal inspection, report	
Is filter backwash recycled? No, NPDES permit	Yes		
What initiates a backwash?	Depends on water quality, head loss, and flow. At a minimum they backwash every 32 hours		
If recycled, does backwash water receive any treatment to decrease	Yes, routed to decant tanks and through plate settlers before	**Backwash**	

pathogen density?	being returned to the head of the plant		
Type of water used for backwash	Filtered/chlorinated finished water	Check back wash SOP	Yes
Are coagulant doses adjusted to accommodate the recycled flow?	Yes	Are jar test conducted to determine the impact of the recycled stream?	Yes

Measurements

CFE		IFE # 8	0.05 NTU
IFE # 1	0.05 NTU	IFE # 9	0.21 NTU
IFE # 2	0.04 NTU	IFE # 10	0.03 NTU
IFE # 3	0.09 NTU	IFE # 11	0.09 NTU
IFE # 4	0.05 NTU	IFE # 13	0.14 NTU
IFE # 5	0.03 NTU	CFE Chlorine Residual	0.01
IFE # 6	0.10 NTU	CFE pH	6.0 pH

Disinfection

Type of Disinfection Used	Chlorine	Where is the disinfection application point?	Pretreatment building, post chlorination in chemical building, rechlorination in Montclair building
Is the disinfection building safe & secure?	Yes	Continuous Operation?	Yes
Are there spill containment provisions?	Yes	Adequate stand by equipment?	Yes
How often is dosage checked?	Online in SCADA and daily via inspection	Where is the residual measured?-	In laboratory in from finish water tap, and downstream of finish water reservoir
Contact Time	See Chlorine CTs in **Attachment D**	Will first customer receive chlorinated water with adequate CT to inactivate 3-log Giardia/4-log virus?	Not Reviewed

Have there been any interruptions in disinfection?	No. When doing short-term repairs increase dosage at pretreatment so adequate downstream	Are daily operating records maintained?	Yes

Comments:_____
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Pump and Pumping Facilities

Name of Pump Station	Clifton Pump Station
Description of pumps (number, types, function)	3 single-speed centrifuge pumps
Pump Capacities (mgd)	10 mgd each
Are flow meters present? Are flow records kept?	Yes
Are redundant pumps present? Is there an isolation valve for each pump?	Yes
Do pumps have excessive vibration or heat when running?	NA
Is security adequate? Are the building and equipment protected from flooding?	Yes
Is lubrication oil food grade and in good shape?	Yes
Are cross connections present at water lubricated pumps? Is each pump equipped with a check valve?	No
Are adequate alarms present?	Yes

Comments: _____

Storage Facilities

Reservoir	Cedar Grove	Elevated, ground storage tank, hydropneumatic?	NA
Tank Location	Holding treated water for distribution	Last inspection/ cleaning date	NA
Type of Material	NA	Capacity	640 MG
Age	105 years	External Condition	
Time since last Cleaning	Never	Vent and vent screen condition	NA
Average Detention Time (Days)	Approximately 7 days	Do overflows terminate 12-24" above the open basin/splash pads? Screened?	NA
Can tank be isolated from the system?	NA	Frequency of inspection and cleaning?	Daily visual inspections
Any issues during low temperatures?	NA	Do overflows have splash pads?	Rip rap overflow approximately 2-3 feet in size that would discharge into stream
Is site security adequate	Yes	If reservoir, enforcement action to cover or treated in place? Status. Interim measures?	ACO to evaluate alternatives, awaiting response from State
Are air vent turned down or covered, screened?	NA		

Comments:_____
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Storage Tank names	Belleville	Elevated, ground storage tank, hydropneumatic?	Below ground
Tank Location	Belleville Complex downstream of Cedar Grove Reservoir	Last inspection/ cleaning date	Unknown and possibly never
Type of Material	Concrete	Capacity	200,000 gallon
Age	Approximately 20 years	External Condition	Below ground
Time since last Cleaning	Unknown and possibly never	Vent and vent screen condition	Adequate
Average Detention Time (Days)	Approximately 3 days	Do overflows terminate 12-24" above the open basin/splash pads? Screened?	Could not ascertain due to snow on ground
Can tank be isolated from the system?	Yes	Frequency of inspection and cleaning?	NA
Any issues during low temperatures?	No	Do overflows have splash pads?	Could not ascertain due to snow on ground
Is site security adequate	Yes	Closed Tank or Reservoir? If reservoir, enforcement action to cover or treated in place? Status. Interim measures?	Closed Tank
Are air vent turned down or covered, screened?	Yes		

Distribution

System Pressure Range	40-120 PSI
Number of Pressure Zones	3
Number of hydrants (flush and fire)	5000 fire hydrants
Number of Dead End Lines	Approximately 25
How many PRVs are present? Any issues?	43 active and 49 total
Are distribution system maps complete?	Yes
Does the system have adequate valving?	Yes, can reconfigure water to move throughout system. Only times that customers are without water is when making minor (less than 2 -4 hour) repairs
Are leaks numerous?	Approximately 20% - 25% total water loss
What disinfection procedure is used for new lines and repairs?	- For new lines super-chlorinate for 48 hours - For line repairs super-chlorinate for approximately 4 hours
Does the system have a flushing program?	- Annually for dead ends in April or May - Others lines are flushed when customer complains
Does the system have adequate spare parts and repair supplies for the distribution system?	Yes store parts at 4 locations. 1) 239 Central Avenue in the distribution office in Newark; 2) 1294 McBride office in Little Falls; 3) Treatment plant; 4) Montclair post chlorination station

Additional Comments:

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